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*Research Note*

# Helminths of the Western Lesser Siren, *Siren intermedia nettingi* (Caudata: Sirenidae), from Arkansas

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ABSTRACT: Sixteen juvenile and adult western lesser sirens, *Siren intermedia nettingi* Goin, 1942, were collected from 2 counties in Arkansas and examined for endoparasites. Eleven (69%) sirens harbored 1 or more parasites, including 1 (6%) with *Diplostomum* sp. metacercariae, 9 (56%) with *Proteocephalus sireni,* 1 (6%) with larval *Capillaria* sp., and 2 (13%) with *Falcaustra chabaudi.* New locality records are documented for *P. sireni* and *F. chabaudi,* and new host records are reported for *Diplostomum* sp. and *Capillaria* sp. The histopathology of the larval *Capillaria* integumental infection is described in the new host. A summary is provided on helminths of *Siren* spp.

KEY WORDS: Amphibia, Arkansas, *Capillaria* sp., Caudata, *Diplostomum* sp., *Falcaustra chabaudi,* histopathology, intensity, prevalence, *Proteocephalus sireni,* Sirenidae, *Siren intermedia nettingi,* survey.

The western lesser siren, *Siren intermedia nettingi* Goin, 1942, is a large eel-like amphibian that ranges through the Mississippi River Valley east to western Alabama and west to eastern Texas (Martof, 1973; Conant and Collins, 1991). Much is known about the natural history and ecology of this salamander (Martof, 1973), including information on its helminths (Nickol, 1972; Dunagan and Miller, 1973; Dyer, 1973; Brooks and Buckner, 1976; Brooks, 1978; Buckner and Nickol, 1979). Except for Louisiana populations, these reports concern sirens from more northern parts of the range in Illinois. Herein, we report on helminths of a small sample of *S. i. nettingi* from Arkansas and provide a summary of helminths of North American *Siren* spp.

A total of 16 juvenile and adult specimens of *S. i. nettingi* (mean ± SE snout–vent length [SVL] = 180.2 ± 85, range 53–290 mm) were collected alive between October 1990 and March 1991, and again during January 1993, with minnow traps, dip nets, or by hand at wetland sites in Montgomery ($N = 13$) and Clay ($N = 3$) counties of Arkansas and examined for endoparasites. Methods for necropsy, coccidial isolation, and preparation and staining of blood films and helminths follow those used by McAllister and Upton (1987). Voucher specimens of hosts are deposited in the Arkansas State University Museum of Zoology (ASUMZ). Specimens of parasites are deposited in the U.S. National Parasite Collection, Beltsville, Maryland 20705, as follows: *Diplostomum* sp. (USNM 82843), *Proteocephalus sireni* (USNM 82844), *Capillaria* sp. (USNM 82845), *Falcaustra chabaudi* (USNM 82842).

Eleven sirens (mean ± SE SVL = 189.7 ± 20.3, range 53–290 mm) were infected with 1 or more helminths, including *Diplostomum* sp. metacercariae, *Proteocephalus sireni,* larval *Capillaria* sp., and *Falcaustra chabaudi.* Two sirens harbored multiple infections of either larval *Capillaria* sp. and *P. sireni* or *Diplostomum* sp. metacercariae and *P. sireni.* Sirens were negative for coccidians, blood hematozoans, and myxozoans.

Numerous strigeoid metacercariae of the diplostomulum type were free in the coelomic and pericardial cavities of a single *S. i. nettingi* (SVL = 252 mm) collected in February 1991 from Montgomery County. The diplostomula appeared identical to the description of the metacercarial stage of *Diplostomum variabile* (Chandler, 1932) Dubois, 1937 (=*Didelphodiplostomum variabile* (Chandler, 1932) Dubois, 1944 (see Harris et al., 1967). This present finding represents a new host record for *Diplostomum* sp.

A total of 39 tapeworms fitting the description of *Proteocephalus sireni* (Brooks and Buckner,



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**Table 1. Summary of helminths of *Siren* spp.**

| Host taxon/parasite | Locality | Reference(s) |
|---|---|---|
| *Siren intermedia nettingi* | | |
| Trematoda | | |
| *Allassostomoides louisianensis* | Illinois | Brooks and Buckner, 1976 |
| *Diplostomum* sp. | Arkansas | This report |
| *Progorgodera foliata* | Illinois | Brooks and Buckner, 1976 |
| Cestoidea | | |
| *Proteocephalus sireni* | Arkansas | This report |
| | Illinois | Brooks and Buckner, 1976 |
| | Louisiana | Brooks, 1978 |
| Acanthocephala | | |
| *Fessisentis fessus* | Illinois | Landewe, 1963; Nickol, 1972; Dunagan and Miller, 1973 |
| | Louisiana | Nickol, 1972; Buckner and Nickol, 1979 |
| *Neoechinorhynchus* sp. | Illinois | Miller and Dunagan, 1971 |
| Nematoda | | |
| *Capillaria* sp. | Arkansas | This report |
| *Falcaustra chabaudi* | Illinois | Dyer, 1973 |
| | Arkansas | This report |
| *Siren intermedia texana* | | |
| Nematoda | | |
| *Contracaecum* sp. | Texas | McAllister and McDaniel, 1992 |
| *Siren lacertina* | | |
| Trematoda | | |
| *Cephalaogonimoides sireni* | Florida | Premvati, 1969 |
| *Diplostomum variabile* | * | Harris et al., 1967 |
| *Gorgodera minima* | Louisiana† | Bennett and Humes, 1938; |
| | Florida | Brooks and Buckner, 1976 |
| *Lechriorchis* sp. | Louisiana† | Bennett and Humes, 1938 |
| *Progorgodera foliata* | Florida | Brooks and Fusco, 1978 |
| *Stomatrema guberleti* | Florida | Brooks and Buckner, 1976 |
| *Telorchis sireni* | * | Zeliff, 1937 |
| *T. stunkardi* | Florida | Brooks and Buckner, 1976 |
| Cestoidea | | |
| *Proteocephalus* sp. | Louisiana† | Bennett and Humes, 1938; |
| | Florida | Loftin, 1960 |
| *P. aberrans* | Florida | Brooks, 1978 |
| Nematoda | | |
| *Brevimulticaecum tenuicolle* | Louisiana† | Bennett and Humes, 1938 |
| *Cosmocercoides dukae* or *C. variabilis* | Florida | Walton, 1938; Baker, 1987 |
| *Falcaustra catesbeianae* | Florida | Walton, 1938 |
| *Siren* sp.‡ | | |
| Trematoda | | |
| *Cephalogonimus amphiumae* | Florida | Manter, 1938 |
| *Clinostomum marginatum* | Florida | Manter, 1938 |
| *Diplostomulum* sp. | Florida | Manter, 1938 |

* Data on locality not provided in reference.

† Sirens collected from the campus of Louisiana State University, Baton Rouge, Louisiana, and reported originally to be *S. lacertina*; however, its range does not include Louisiana (Conant and Collins, 1991). In all probability the host is *S. intermedia.*

‡ Species of siren not reported. The ranges of *S. intermedia, S. lacertina, Pseudobranchus axanthus,* and *P. striatus* include Florida (Conant and Collins, 1991).

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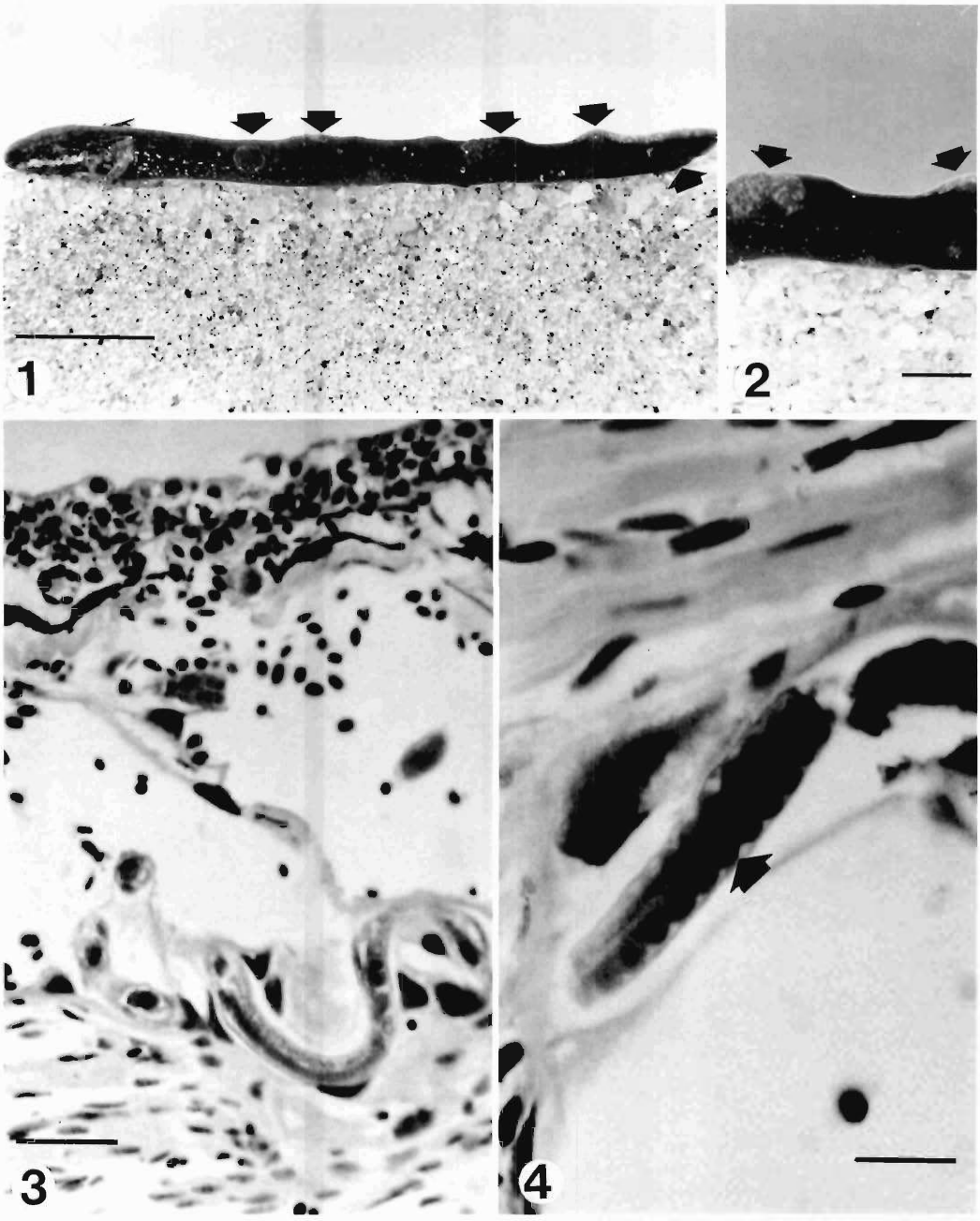


**Figures 1–4.** Larval *Capillaria* sp. infecting the integument of a juvenile *Siren intermedia nettingi* (ASUMZ 16992) from Montgomery County, Arkansas. 1. View of siren showing raised and discolored areas on integument (arrows) infected with larvae. Scale bar = 15 mm. 2. Closer view showing areas of infection on integument. Scale bar = 7.5 mm. 3. Section of skin showing parasite in wall of dermal capillary with severe ectasia of superficial vasculature as well as degeneration and edema in overlying epidermis. Scale bar = 100 μm. 4. Closer view of parasite in dermal vessel. Note stichostome (arrow). Scale bar = 35 μm.

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1976) Brooks, 1978, were recovered from the duodenum of 9 sirens (173.6 ± 20.7, 53–252 mm) collected only at the Montgomery County site; mean intensity was 4.3 ± 1.4 (range 1–15) worms. This cestode has been reported previously from *S. i. nettingi* in Illinois and Louisiana (Table 1).

Four kathlaniid nematodes, *Falcaustra chabaudi* Dyer, 1973, were in the rectum of 2 *S. i. nettingi* (235 and 290 mm SVL) collected in February 1991 from Clay County; mean intensity was 2.0 ± 1.0 (range 1–3) worms. This is the first report of *F. chabaudi* from Arkansas. Dyer (1973) described *F. chabaudi* from 2 *S. i. nettingi* in southern Illinois.

A single juvenile *S. i. nettingi* (SVL = 53 mm; ASUMZ 16992) collected in October 1990 from the Montgomery County site was infected with larval *Capillaria* sp. in the integument (Figs. 1, 2). The epidermis of ASUMZ 16992 showed separation of the pigment layer from the underlying basement membrane with moderate hydropic change at the dermal interface. In the dermis there was marked edema with dilation of numerous vascular channels. The larvae adhered to the walls of these dilated vessels (Fig. 3) while provoking no discernable inflammatory response. Dermal connective tissue was unaffected by the presence of this parasite. The stichostome, typical of trichuroid nematodes (Noble et al., 1989), is shown in Figure 4.

A summary of the helminths of *Siren* spp. is presented in Table 1. There appears to be some host specificity among helminths from different siren taxa, particularly among trematodes of lesser and greater sirens. Although *S. intermedia* and *S. lacertina* may be found in sympatry, they appear to be partitioned by habitat differences. The former tends to inhabit more acidic pH waters while the latter is found in aquatic sites with circumneutral pH (P. E. Moler, pers. comm.). This may help explain differences in the trematode faunas of the 2 species as intermediate hosts may also be partitioned in the same manner.

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***Research Note***

# New Host and Distribution Record of *Raillietina (Raillietina) coreensis* (Cestoda) from *Apodemus argenteus* (Rodentia) in Japan

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ABSTRACT: *Raillietina (Raillietina) coreensis* Honda, 1939 is redescribed from the small intestine of *Apodemus argenteus* (Rodentia: Muridae) in Hokkaido, Japan. This report represents a new host and distribution record for *R. coreensis* in the host and in Japan.

KEY WORDS: *Raillietina (Raillietina) coreensis,* cestode, Davaineidae, *Apodemus argenteus,* rodent, Japan.

Cestodes of the genus *Raillietina* Fuhrmann, 1920 have been reported from various rodents in the tropical and subtropical zones. However, there are few records of *Raillietina* from *Apodemus* Kaup, 1829 (Rodentia). We obtained *Raillietina (Raillietina) coreensis* Honda, 1939 from a small Japanese field mouse, *Apodemus argenteus* (Temminck) in Hokkaido, Japan, representing a new host and distribution record for the parasite.

Cestodes were collected from the small intestine of an *A. argenteus* (female, 10–18 mo old) captured at Abuta, Hokkaido, Japan in October 1991. Worms were lightly pressed, fixed in 70% ethanol, stained with acetocarmine, dehydrated in an ethanol series, cleared in xylene, and mounted in MGK® (Matsunami Glass Ind., Ltd., Japan). All measurements in fixed specimens are in micrometers unless otherwise indicated and given as a range with the mean in parentheses.

## *Raillietina coreensis* Honda, 1939 (Figs. 1–3)

Redescription (based on 2 specimens): Total body length 61 and 114 (88) mm, maximum width 2 mm. Scolex 363 and 554 (459) long by 264 and 528 (396) wide. Four suckers oval, 106–123 (117) long by 92–115 (102) wide, with numerous hooks 7–8 long, arranged diagonally with about 7 hooks per row on the inside of the sucker. Rostellum 86–99 (93) wide. Most of rostellar hooks lost during processing. One remaining hook hammer-shaped and 13 long. Proglottids trapezoidal. Mature proglottids 132–238 (180) long by 785–1,465 (1,033) wide. Genital pore unilateral, usually located in anterolateral position in mature proglottids; some situated near middle of margin. Testes 24–29 (27) in number lying on

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